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AF/1761

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

ATTY.'S DOCKET: KATO=15

In re Application of:)	Art Unit: 1761
)	
Yukihisa KATO, et al.)	Examiner: C.E. SHERRER
)	
Appln. No.: 09/144,851)	Confirmation No. 5275
)	
Filed: September 1, 1998)	Washington, D.C.
)	
For: FRUIT VINEGAR FROM RAW)	November 28, 2003
MATERIAL...)	

BRIEF ON APPEAL

Honorable Commissioner for Patents
U.S. Patent and Trademark Office
2011 South Clark Place
Customer Window, Mail Stop Brief-Patents
Crystal Plaza Two, Lobby, Room 1B03
Arlington, VA 22202

Sir:

Submitted herewith is applicant's Brief on Appeal in triplicate. This brief replaces the brief filed August 28, 2003, in response to an Office Communication mailed November 21, 2003.

The present appeal is taken from the action of the examiner in finally rejecting claims 21-24 and 27-31. The full text of the claims appears in Appendix A attached hereto.

REAL PARTY IN INTEREST

The real party in interest in the present application is the assignee of the application, POKKA

In re of Appln. No. 09/144,851

CORPORATION, 35-16. DIAKAN-CHO, HIGASHI-KU NAGOYA-SHI, AICHI-KEN, JAPAN.

The assignment of the instant application was recorded in the PTO on October 30, 1998, at reel/frame 9581/0677.

RELATED APPEALS AND INTERFERENCES

The undersigned is not aware of any appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in the present appeal.

STATUS OF CLAIMS

Claims 1-20 and 25-26 have been cancelled.

Claims 21-24 and 27-31 have been rejected and are appealed.

STATUS OF AMENDMENTS

The amendment filed November 1, 2002, has been entered. No amendment was filed after the final rejection of January 9, 2003.

SUMMARY OF THE INVENTION

The present invention provides a method for producing vinegar from fruits which traditionally have not been used to produce vinegar, namely, citrus fruit (page 3,

lines 8-12). These fruit juices contain more citric acid than fruit juices from which vinegar is conventionally produced, namely, grape juices and apple juices. Citric acid has a lower pH than acetic acid, and it has been found that the citric acid damages the activity of the acetic acid bacteria used in making vinegar. Heretofore it has not been possible to produce vinegar from citrus fruit juices unless the citrus fruit juices have a juice concentration of 10% or less (page 3, lines 13 through page 4, line 7).

The present inventors discovered that when citric acid is removed from citrus fruit juice, the pH of the juice increases and there is no interference with the action of acetic acid bacteria. Accordingly, the present invention provides a method for making vinegar from citrus fruit by first removing some or all of the citric acid from the juice (page 4, lines 16-24).

The method of the present invention involves removing from 50 to 100% of the citric acid from citric fruit juice by adding calcium carbonate to the juice to form a precipitate comprising calcium citrate, and then removing the calcium citrate by removing the calcium citrate precipitate or by treating the juice with an anion exchange resin. Juice from which the citric acid has been removed can be blended

with juice which naturally has a lower amount of citric acid.
(page 5, line 21 through page 6, line 12).

Alternatively, citrus acid juice from which some of the citric acid has been removed can be diluted with water, an aqueous solution of glucose, fruit juices having a low concentration of citric acid such as grape juice and apple juice, saccharification solutions of starches and saccharification solutions of grain flours (page 6, lines 13-19).

Once the citric acid has been wholly or partly removed from the citrus fruit juice, the juice is subjected to alcohol fermentation (page 7, lines 13-21).

ISSUES

1. Whether claims 21-24 and 27-30 are unpatentable under 35 U.S.C. 103(a) over Seike in view of Jackson.

2. Whether claim 31 is unpatentable under 35 U.S.C. 103(a) over Seike in view of Jackson and further in view of Castillon et al.

GROUPING OF CLAIMS

For the rejection of claims 21-24 and 27-30 as being unpatentable under 35 U.S.C. 103(a) over Seike in view of Jackson, these claims stand or fall together.

For the rejection of claim 31 as being unpatentable under 35 U.S.C. 103(a) over Seike in view of Jackson and further in view of Castillon et al., since claim 31 is the only claim rejected, there is no group of claims.

A R G U M E N T

1. Claims 21-24 and 27-30 are patentable under 35 U.S.C. 103(a) over Seike in view of Jackson

In rejecting claims 21-30, the Examiner alleged that Seike teaches production of wine from citrus fruits, such as lemons, whereby the fruit juice is clarified with an enzyme, acid adjusted, sterilized, cooled, treated with alcohol, inoculated with acetic acid bacteria and fermented, matured, filtered, and juice from unripe fruit is added. The Examiner conceded that Seike does not specifically teach reducing the citric acid content of the juice.

Jackson is said to teach reducing the acidity of wine or grape juice by precipitation by calcium carbonate and column ion exchange.

The present invention provides a method for preparing vinegar from citrus fruit juices that contain a higher percentage of citric acid than apple juice or grape juice, the two juices from which vinegar is conventionally produced. The pH of citric acid is lower than the pH of acetic acid, and this lower pH interferes with the activity of

acetic acid bacteria, making it difficult to ferment citrus fruit juices to vinegar unless the juices are diluted to such a low concentration that production of vinegar is uneconomical..

It has been known to add an alkaline agent to citrus fruit juices to raise the pH of the juices. Unfortunately, this technique adversely affects the flavor of the resulting fruit vinegar.

Seike, abstract of Japanese publication no. JP04190780, discloses treating citrus fruit juices with an enzyme to clarify the fruit juice, and raising the pH of the fruit juice to pH 4-6. There is no indication in Seike of how the pH of the juice is raised to pH 4-6.

Jackson discusses acidity and pH of juices on page 229 as follows: "Juice and must failing to possess the desired acidity and pH may be adjusted before fermentation. Acidification of low acid juice and must often occurs before fermentation because it limits the growth of spoilage microorganisms and may be illegal after fermentation in some jurisdictions. In contrast, deacidification typically occurs after fermentation, when its effect on acidity is known. Deacidification can be based on actual rather than predicted need. Flavor production also is generally better in musts fermented at a low pH.' Finally, postfermentative

deacidification permits the process to be delayed until spring, when other winery activities are less urgent."

Thus, it is clear that Jackson discloses that juice and must are typically deacidified after fermentation.

On page 279, Jackson describes deacidification as follows:

"Deacidification with calcium carbonate is probably the most common procedure, as use of potassium carbonate is prohibited in several countries and potassium tartrate tends to be more expensive. Although widely used, calcium carbonate has a number of disadvantages. Its primary drawback is the slow rate at which calcium tartrate precipitates. In addition formation of the soluble salt of calcium malate may produce a salty taste. Furthermore, if tartrate removal is excessive, the resultant increase in pH may leave the wine tasting "flat" and susceptible to microbial spoilage."

It is clear from the above description that Jackson deacidifies grape juice or [grape] must by removing tartaric acid, not citric acid.

The Examiner has shown no motivation to combine Seike with Jackson to render the present claims obvious. Seike clarifies juice of citrus fruit and then reduces the acidity of the juice, but there is no indication of how this acidity is reduced. Jackson reduces the acidity of grape

juice or must, but states that this is typically done after fermentation. Jackson then discloses that calcium carbonate is added to remove tartaric acid. There is no reason for Jackson to remove citric acid from the juice, because grape juice, unlike citrus fruit juice, does not contain sufficient citric acid to prevent acetic acid fermentation.

In the present invention, calcium carbonate is added prior to fermentation to reduce the citric acid content of the juice. The calcium citrate formed is removed from the juice prior to fermentation. The present applicants also note in the specification as filed at page 4, lines 7-16, that adding an alkaline agent to the juice to elevate the pH of the juice severely affects the flavor of the resulting fruit vinegar. However, by precipitating calcium citrate and removing this precipitate from the juice, any alteration of the taste of the juice is prevented.

It should be noted that Seike adds juice obtained from unripe citrus fruit for flavoring the vinegar produced by the process disclosed. One could infer from this that the flavor of the vinegar produced is not acceptable, or there would be no reason to add additional juice to the vinegar produced. The vinegar produced by the process of the present invention, however, in which citric acid is precipitated as calcium citrate and physically removed from the juice prior to

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fermentation, has a refreshing flavor and less irritation as compared with grain vinegar having the same concentration of acetic acid (specification, page 11, lines 20-24).

To reject claims in an application under section 103, an examiner must show an un rebutted *prima facie* case of obviousness. See *In re Deuel*, 51 F3d 1552, 1557, 34 USPQ 2d 1210, 1214 (Fed. Cir. 1995). In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirement is entitled to a patent. See *In re Oetiker*, 977 F2d 1443, 1445, USPQ 2d 1443, 1444 (Fed. Cir. 1992).

When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. See *In re Geiger*, 815 F.2d 686, 688, 2 USPQ 2d 1276, 1278 (Fed. Cir. 1987). Although the suggestion to combine references may flow from the nature of the problem, see *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ 2d 1626, 1630 (Fed. Cir. 1996), the suggestion more often comes from the teachings of the pertinent references, see *In re Sernaker*, 702 F.2d 989, 994, 217 USPQ 1, 5 (Fed. Cir. 1983), or from the ordinary knowledge of those skilled in the art that certain references are of special importance in a particular field, see *Pro-Mold*, 75 F.3d at 1573 (citing *Ashland Oil, Inc. v.*

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Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n.24, 227 USPQ 657, 667 n.24 (Fed. Cir. 1985)). Therefore, "when determining the patentability of a claimed invention which combines two known elements, 'the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" See *In re Beattie*, 974 F.2d 1309, 1311-12, 24 USPQ 2d 1040, 1042 (Fed. Cir. 1992) (quoting *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984)).

Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. See 35 U.S.C. 103(a). This legal construct is akin to the "reasonable person" used as a reference in negligence determinations. The legal construct also presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan. See *In re Carlson*, 983 F.2d 1032, 1038, 25 USPQ 2d 1207, 1211 (Fed. Cir. 1993).

As the Federal Circuit has stated, "virtually all [inventions] are combinations of old elements." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698, 218 USPQ 865, 870 (Fed. Cir. 1983); see also *Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1579-80, 219 USPQ 8, 12 (Fed. Cir. 1983)

("Most, if not all, inventions are combinations and mostly of old elements."). Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570, 38 USPQ 2d 1551, 1554 (Fed. Cir. 1996).

To prevent the use of hindsight based on the invention to defeat patentability of the invention, the examiner is required to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

The Federal Circuit has identified three possible sources for a motivation to combine references: the nature of

the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. The Examiner did not explain the specific motivation to combine Jackson and Seike, since Seike is silent with respect to adjusting the acidity of the juice to be fermented, and Jackson discusses adjusting the pH of (non-citrus) juice by removing tartaric acid, typically after fermentation is complete. One looking to adjust the pH of citrus fruit juice for fermentation would not look to Jackson, because Jackson teaches that deacidification typically occurs after fermentation.

With respect to cooking food, in which addition or elimination of common ingredients is said not to confer patentability on a process [*In re Levin*, 84 USPQ 232 (CCPA, 1949)], the process claimed herein is not a recipe for cooking food, but is a process for fermenting citrus fruit juice to produce vinegar. In the process claimed herein, citric acid is removed by adding calcium carbonate for precipitate calcium citrate, and the calcium citrate is removed from the juice prior to fermentation. That is, the citrate ion is physically removed from the juice. Jackson discloses adding calcium carbonate to neutralize excess acid in the juice, but there is no indication that a precipitate forms that is removed prior to fermentation, nor that there is any citrate ion to be

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removed. In fact, Jackson teaches that deacidification typically occurs after fermentation, which would not lead one skilled in the art to deacidify prior to fermentation.

As the Federal Circuit stated in *In re Lee*, 61 USPQ 2d 1430 (Fed. Cir. 2002), "As applied to the determination of patentability *vel non*, when the issue is obviousness, 'it is fundamental that rejections under 35 U.S.C. 103 must be based on evidence comprehended by the language of that section.' *In re Grasselli*, 53 USPQ 2d 1769, 1774 (Fed. Cir. 2000) ... When patentability turns on the question of obviousness, the search for an analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness *See, e.g., McGinley v. Franklin Sports, Inc*, 60 USPQ 2d 1001, 1008 (Fed. Cir. 2001) ('the central question is whether there is a reason to combine [the] references,' a question of fact drawing on the *Graham* factors."

'The factual inquiry whether to combine references must be thorough and searching.' *Id.* This precedent has been reinforced in myriad decisions, and cannot be dispensed with, *See, e.g., Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 56 USPQ 2d 1456, 1459 (Fed. Cir. 2000). ('a showing of a suggestion, teaching, or motivation to combine the prior art

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references is an "essential component of an obviousness holding"') (quoting *C. R. Bard, Inc. v. M3 Systems, Inc.* 48 USPQ 2d (Fed. Cir. 1998)) The Court went on to quote *In re Dembiczak*, 50 USPQ 2d 1614, 1617 (Fed. Cir. 1999), "Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."

There is a requirement for specificity in combining references, *See, In re Kotzab*, 55 USPQ 2d 1313, 1317 (Fed. Cir. 2002) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed.").

In the present case, the Examiner has shown no motivation to deacidify citrus fruit juice prior to fermentation by adding calcium carbonate to precipitate at least some of the citric acid present in the citrus fruit juice to adjust the pH of the juice to 3.0 or more to ensure acetic fermentation. Seike is silent with respect to how the acidity of the citrus fruit juice is to be adjusted. One skilled in the art would not look to Jackson for a method for adjusting the acidity of the juice, because Jackson teaches that fruit juice is deacidified typically after fermentation.

2. Claim 31 is not unpatentable under 35 U.S.C. 103(a) over Seike in view of Jackson and further in view of Castillon et al.

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seike in view of Jackson and further in view of Castillon et al. Seike in view of Jackson is said to teach that which is cited above, but the Examiner concedes that neither reference teaches the use of ultrafiltration in connection with vinegar. Castillon et al. are said to teach ultrafiltration membranes are commonly used to purify vinegar.

It is clear from the discussion above that one skilled in the art would not be motivated by reading Seike with Jackson to prepare vinegar from citrus fruit juice by deacidifying the juice by adding calcium carbonate to precipitate calcium citrate and removing the calcium citrate prior to fermentation of the juice, and the disclosure of Castillon et al. adds nothing to Seike or Jackson to render claim 31 obvious. Castillon is merely cited for the teaching that ultrafiltration membranes are commonly used to clarify vinegar. This adds nothing to the teaching of Seike and Jackson to deacidify the citrus fruit juice prior to fermentation by removing the citric acid from the juice by forming a precipitate of calcium citrate and removing the calcium citrate prior to fermentation.

CONCLUSION

There is nothing in the combination of Seike and Jackson that would lead one skilled in the art to make vinegar from citrus fruit juice by removing at least some of the citric acid prior to fermentation. There is nothing in the combination of Seike, Jackson, and Castillon et al. that would lead one skilled in the art to make vinegar from citrus fruit juice by removing at least some of the citric acid prior to fermentation, fermenting the juice, and using an ultrafiltration membrane to clarify the resulting vinegar.

Claims 21-24 and 27-31 are patentable over the cited references because there is no motivation to combine the references to arrive at the herein claimed invention, namely, that at least some citric acid is removed from citrus fruit juice prior to fermentation.

Wherefore, it is respectfully requested that this Board reverse the rejection of claims 21-24 and 27-31.

In re of Appln. No. 09/144,851

Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant(s)

By

A handwritten signature in cursive script, appearing to read "Anne M. Kornbau", written over a horizontal line.

Anne M. Kornbau

Registration No. 25,884

AMK:nmp

Telephone No.: (202) 628-5197

Facsimile No.: (202) 737-3528

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TABLE OF AUTHORITIES

Cases

<i>Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.</i> , 776 F.2d 281, 297 n.24, 227 USPQ 657, 667 n.24 (Fed. Cir. 1985)	10
<i>Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.</i> , 56 USPQ 2d 1456, 1459 (Fed. Cir. 2000)	15
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<i>In re Carlson</i> , 983 F.2d 1032, 1038, 25 USPQ 2d 1207, 1211 (Fed. Cir. 1993)	11
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<i>In re Lee</i> , 61 USPQ 2d 1430 (Fed. Cir. 2002)	14
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<i>In re Oetiker</i> , 977 F.2d 1443, 1445, USPQ 2d 1443, 1444 (Fed. Cir. 1992)	9
<i>In re Sernaker</i> , 702 F.2d 989, 994, 217 USPQ 1, 5 (Fed. Cir. 1983)	10
<i>Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.</i> , 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984)	11
<i>McGinley v. Franklin Sports, Inc.</i> , 60 USPQ 2d 1001, 1008 (Fed. Cir. 2001)	15
<i>Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.</i> , 75 F.3d 1568, 1573, 37 USPQ 2d 1626, 1630 (Fed. Cir. 1996)	9

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Pro-Mold, 75 F.3d at 1573 10

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Richdel, Inc. v. Sunspool Corp., 714 F.2d 1573, 1579-80, 219
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Sensonics, Inc. v. Aerosonic Corp., 81 F.3d 1566, 1570, 38
USPQ 2d 1551, 1554 (Fed. Cir. 1996) 12

Statutes

35 U.S.C. 103 14

35 U.S.C. 103(a) 4, 5, 11, 17

APPENDIX

1-20. canceled

21. A method for producing a fruit vinegar comprising subjecting to acetic acid fermentation by acetic acid bacteria in the presence of ethanol one member selected from the group consisting of (a) and (b), wherein

(a) is a member selected from the group consisting of lemon juice, lime juice, yuzu juice, kabosu juice, sudachi juice, and shii kuwasa juice, wherein said member is

(1) juice having naturally a pH value of 3.0 or more;

(2) juice having a pH value of 3.0 or more adjusted, not by addition of an agent to neutralize citric acid but by reducing citric acid content by from 50 to 100% by weight, or

(3) a mixture of (1) and (2); and

(b) a dilution of (a);

wherein the reducing of citric acid content in (2) has been effected by

(i) adding calcium carbonate to the member to precipitate calcium citrate and removing the calcium citrate or

(ii) contacting the member with an anion exchange resin to remove citric acid therefrom.

22. The method according to claim 21 wherein the concentration of (a) in the dilution of (b) is not less than 10% by weight and is less than 100% by weight.

23. The method according to claim 21 wherein the dilution of (a) is prepared by diluting (a) with at least one member selected from the group consisting of water, an aqueous solution of glucose, a fruit juice, a saccharification solution of starch and a saccharification solution of grain flour.

24. The method according to claim 23 wherein the fruit juice is at least one member elected from the group consisting of apple juice and grape juice.

25-26. canceled

27. The method according to claim 21 wherein the ethanol is prepared by at least one method selected from the group consisting of:

(A) subjecting one member selected from the group consisting of (a) and (b) to alcohol fermentation using yeast; and

(B) adding ethanol or an aqueous solution of ethanol.

28. The method according to claim 27 wherein ethanol or an aqueous solution of ethanol is further added once or at a plurality of times between initiation of acetic acid fermentation and the end of the acetic acid fermentation.

29. The method according to claim 21 wherein one member selected from the group consisting of lemon juice, lime juice, yuzu juice, kabosu juice, sudachi juice and shii kuwasa juice, wherein each juice has a citric acid content of 3 to 8% by weight, is further added one time or several times in the latter half of the acetic acid fermentation.

30. The method according to claim 21 wherein the acetic acid fermentation is carried out by using an acetator.

31. The method according to claim 21 wherein after the acetic acid fermentation, the fruit vinegar is subjected to ultra filtration.



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U.S. Patent and Trademark Office
2011 South Clark Place
Customer Window, Mail Stop Brief-Patents
Crystal Plaza Two, Lobby, Room 1B03
Arlington, VA 22202

Sir:

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lines 8-12). These fruit juices contain more citric acid than fruit juices from which vinegar is conventionally produced, namely, grape juices and apple juices. Citric acid has a lower pH than acetic acid, and it has been found that the citric acid damages the activity of the acetic acid bacteria used in making vinegar. Heretofore it has not been possible to produce vinegar from citrus fruit juices unless the citrus fruit juices have a juice concentration of 10% or less (page 3, lines 13 through page 4, line 7).

The present inventors discovered that when citric acid is removed from citrus fruit juice, the pH of the juice increases and there is no interference with the action of acetic acid bacteria. Accordingly, the present invention provides a method for making vinegar from citrus fruit by first removing some or all of the citric acid from the juice (page 4, lines 16-24).

The method of the present invention involves removing from 50 to 100% of the citric acid from citric fruit juice by adding calcium carbonate to the juice to form a precipitate comprising calcium citrate, and then removing the calcium citrate by removing the calcium citrate precipitate or by treating the juice with an anion exchange resin. Juice from which the citric acid has been removed can be blended.

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with juice which naturally has a lower amount of citric acid.
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deacidification permits the process to be delayed until spring, when other winery activities are less urgent."

Thus, it is clear that Jackson discloses that juice and must are typically deacidified after fermentation.

On page 279, Jackson describes deacidification as follows:

"Deacidification with calcium carbonate is probably the most common procedure, as use of potassium carbonate is prohibited in several countries and potassium tartrate tends to be more expensive. Although widely used, calcium carbonate has a number of disadvantages. Its primary drawback is the slow rate at which calcium tartrate precipitates. In addition formation of the soluble salt of calcium malate may produce a salty taste. Furthermore, if tartrate removal is excessive, the resultant increase in pH may leave the wine tasting "flat" and susceptible to microbial spoilage."

It is clear from the above description that Jackson deacidifies grape juice or [grape] must by removing tartaric acid, not citric acid.

The Examiner has shown no motivation to combine Seike with Jackson to render the present claims obvious. Seike clarifies juice of citrus fruit and then reduces the acidity of the juice, but there is no indication of how this acidity is reduced. Jackson reduces the acidity of grape

juice or must, but states that this is typically done after fermentation. Jackson then discloses that calcium carbonate is added to remove tartaric acid. There is no reason for Jackson to remove citric acid from the juice, because grape juice, unlike citrus fruit juice, does not contain sufficient citric acid to prevent acetic acid fermentation.

In the present invention, calcium carbonate is added prior to fermentation to reduce the citric acid content of the juice. The calcium citrate formed is removed from the juice prior to fermentation. The present applicants also note in the specification as filed at page 4, lines 7-16, that adding an alkaline agent to the juice to elevate the pH of the juice severely affects the flavor of the resulting fruit vinegar. However, by precipitating calcium citrate and removing this precipitate from the juice, any alteration of the taste of the juice is prevented.

It should be noted that Seike adds juice obtained from unripe citrus fruit for flavoring the vinegar produced by the process disclosed. One could infer from this that the flavor of the vinegar produced is not acceptable, or there would be no reason to add additional juice to the vinegar produced. The vinegar produced by the process of the present invention, however, in which citric acid is precipitated as calcium citrate and physically removed from the juice prior to

fermentation, has a refreshing flavor and less irritation as compared with grain vinegar having the same concentration of acetic acid (specification, page 11, lines 20-24).

To reject claims in an application under section 103, an examiner must show an un rebutted *prima facie* case of obviousness. See *In re Deuel*, 51 F3d 1552, 1557, 34 USPQ 2d 1210, 1214 (Fed. Cir. 1995). In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirement is entitled to a patent. See *In re Oetiker*, 977 F2d 1443, 1445, USPQ 2d 1443, 1444 (Fed. Cir. 1992).

When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. See *In re Geiger*, 815 F.2d 686, 688, 2 USPQ 2d 1276, 1278 (Fed. Cir. 1987). Although the suggestion to combine references may flow from the nature of the problem, see *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ 2d 1626, 1630 (Fed. Cir. 1996), the suggestion more often comes from the teachings of the pertinent references, see *In re Sernaker*, 702 F.2d 989, 994, 217 USPQ 1, 5 (Fed. Cir. 1983), or from the ordinary knowledge of those skilled in the art that certain references are of special importance in a particular field, see *Pro-Mold*, 75 F.3d at 1573 (citing *Ashland Oil, Inc. v.*

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Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n.24, 227 USPQ 657, 667 n.24 (Fed. Cir. 1985)). Therefore, "when determining the patentability of a claimed invention which combines two known elements, 'the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" See *In re Beattie*, 974 F.2d 1309, 1311-12, 24 USPQ 2d 1040, 1042 (Fed. Cir. 1992) (quoting *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984)).

Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. See 35 U.S.C. 103(a). This legal construct is akin to the "reasonable person" used as a reference in negligence determinations. The legal construct also presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan. See *In re Carlson*, 983 F.2d 1032, 1038, 25 USPQ 2d 1207, 1211 (Fed. Cir. 1993).

As the Federal Circuit has stated, "virtually all [inventions] are combinations of old elements." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698, 218 USPQ 865, 870 (Fed. Cir. 1983); see also *Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1579-80, 219 USPQ 8, 12 (Fed. Cir. 1983)

("Most, if not all, inventions are combinations and mostly of old elements."). Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570, 38 USPQ 2d 1551, 1554 (Fed. Cir. 1996).

To prevent the use of hindsight based on the invention to defeat patentability of the invention, the examiner is required to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

The Federal Circuit has identified three possible sources for a motivation to combine references: the nature of

the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. The Examiner did not explain the specific motivation to combine Jackson and Seike, since Seike is silent with respect to adjusting the acidity of the juice to be fermented, and Jackson discusses adjusting the pH of (non-citrus) juice by removing tartaric acid, typically after fermentation is complete. One looking to adjust the pH of citrus fruit juice for fermentation would not look to Jackson, because Jackson teaches that deacidification typically occurs after fermentation.

With respect to cooking food, in which addition or elimination of common ingredients is said not to confer patentability on a process [*In re Levin*, 84 USPQ 232 (CCPA, 1949)], the process claimed herein is not a recipe for cooking food, but is a process for fermenting citrus fruit juice to produce vinegar. In the process claimed herein, citric acid is removed by adding calcium carbonate for precipitate calcium citrate, and the calcium citrate is removed from the juice prior to fermentation. That is, the citrate ion is physically removed from the juice. Jackson discloses adding calcium carbonate to neutralize excess acid in the juice, but there is no indication that a precipitate forms that is removed prior to fermentation, nor that there is any citrate ion to be

removed. In fact, Jackson teaches that deacidification typically occurs after fermentation, which would not lead one skilled in the art to deacidify prior to fermentation.

As the Federal Circuit stated in *In re Lee*, 61 USPQ 2d 1430 (Fed. Cir. 2002), "As applied to the determination of patentability *vel non*, when the issue is obviousness, 'it is fundamental that rejections under 35 U.S.C. 103 must be based on evidence comprehended by the language of that section.' *In re Grasselli*, 53 USPQ 2d 1769, 1774 (Fed. Cir. 2000) ... When patentability turns on the question of obviousness, the search for an analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness *See, e.g., McGinley v. Franklin Sports, Inc*, 60 USPQ 2d 1001, 1008 (Fed. Cir. 2001) ('the central question is whether there is a reason to combine [the] references,' a question of fact drawing on the *Graham* factors."

'The factual inquiry whether to combine references must be thorough and searching.' *Id.* This precedent has been reinforced in myriad decisions, and cannot be dispensed with, *See, e.g., Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 56 USPQ 2d 1456, 1459 (Fed. Cir. 2000). ('a showing of a suggestion, teaching, or motivation to combine the prior art

references is an "essential component of an obviousness holding"') (quoting *C. R. Bard, Inc. v. M3 Systems, Inc.* 48 USPQ 2d (Fed. Cir. 1998)) The Court went on to quote *In re Dembiczak*, 50 USPQ 2d 1614, 1617 (Fed. Cir. 1999), "Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."

There is a requirement for specificity in combining references, *See, In re Kotzab*, 55 USPQ 2d 1313, 1317 (Fed. Cir. 2002) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed.").

In the present case, the Examiner has shown no motivation to deacidify citrus fruit juice prior to fermentation by adding calcium carbonate to precipitate at least some of the citric acid present in the citrus fruit juice to adjust the pH of the juice to 3.0 or more to ensure acetic fermentation. Seike is silent with respect to how the acidity of the citrus fruit juice is to be adjusted. One skilled in the art would not look to Jackson for a method for adjusting the acidity of the juice, because Jackson teaches that fruit juice is deacidified typically after fermentation.

2. Claim 31 is not unpatentable under 35 U.S.C. 103(a) over Seike in view of Jackson and further in view of Castillon et al.

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Seike in view of Jackson and further in view of Castillon et al. Seike in view of Jackson is said to teach that which is cited above, but the Examiner concedes that neither reference teaches the use of ultrafiltration in connection with vinegar. Castillon et al. are said to teach ultrafiltration membranes are commonly used to purify vinegar.

It is clear from the discussion above that one skilled in the art would not be motivated by reading Seike with Jackson to prepare vinegar from citrus fruit juice by deacidifying the juice by adding calcium carbonate to precipitate calcium citrate and removing the calcium citrate prior to fermentation of the juice, and the disclosure of Castillon et al. adds nothing to Seike or Jackson to render claim 31 obvious. Castillon is merely cited for the teaching that ultrafiltration membranes are commonly used to clarify vinegar. This adds nothing to the teaching of Seike and Jackson to deacidify the citrus fruit juice prior to fermentation by removing the citric acid from the juice by forming a precipitate of calcium citrate and removing the calcium citrate prior to fermentation.

CONCLUSION

There is nothing in the combination of Seike and Jackson that would lead one skilled in the art to make vinegar from citrus fruit juice by removing at least some of the citric acid prior to fermentation. There is nothing in the combination of Seike, Jackson, and Castillon et al. that would lead one skilled in the art to make vinegar from citrus fruit juice by removing at least some of the citric acid prior to fermentation, fermenting the juice, and using an ultrafiltration membrane to clarify the resulting vinegar.

Claims 21-24 and 27-31 are patentable over the cited references because there is no motivation to combine the references to arrive at the herein claimed invention, namely, that at least some citric acid is removed from citrus fruit juice prior to fermentation.

Wherefore, it is respectfully requested that this Board reverse the rejection of claims 21-24 and 27-31.

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Respectfully submitted,

BROWDY AND NEIMARK, P.L.L.C.
Attorneys for Applicant(s).

By



Anne M. Kornbau
Registration No. 25,884

AMK:nmp

Telephone No.: (202) 628-5197

Facsimile No.: (202) 737-3528

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APPENDIX

1-20. canceled

21. A method for producing a fruit vinegar comprising subjecting to acetic acid fermentation by acetic acid bacteria in the presence of ethanol one member selected from the group consisting of (a) and (b), wherein

(a) is a member selected from the group consisting of lemon juice, lime juice, yuzu juice, kabosu juice, sudachi juice, and shii kuwasa juice, wherein said member is

(1) juice having naturally a pH value of 3.0 or more;

(2) juice having a pH value of 3.0 or more adjusted, not by addition of an agent to neutralize citric acid but by reducing citric acid content by from 50 to 100% by weight, or

(3) a mixture of (1) and (2); and

(b) a dilution of (a);

wherein the reducing of citric acid content in (2) has been effected by

(i) adding calcium carbonate to the member to precipitate calcium citrate and removing the calcium citrate or

(ii) contacting the member with an anion exchange resin to remove citric acid therefrom.

22. The method according to claim 21 wherein the concentration of (a) in the dilution of (b) is not less than 10% by weight and is less than 100% by weight.

23. The method according to claim 21 wherein the dilution of (a) is prepared by diluting (a) with at least one member selected from the group consisting of water, an aqueous solution of glucose, a fruit juice, a saccharification solution of starch and a saccharification solution of grain flour.

24. The method according to claim 23 wherein the fruit juice is at least one member elected from the group consisting of apple juice and grape juice.

25-26. canceled

27. The method according to claim 21 wherein the ethanol is prepared by at least one method selected from the group consisting of:

(A) subjecting one member selected from the group consisting of (a) and (b) to alcohol fermentation using yeast; and

(B) adding ethanol or an aqueous solution of ethanol.

28. The method according to claim 27 wherein ethanol or an aqueous solution of ethanol is further added once or at a plurality of times between initiation of acetic acid fermentation and the end of the acetic acid fermentation.

29. The method according to claim 21 wherein one member selected from the group consisting of lemon juice, lime juice, yuzu juice, kabosu juice, sudachi juice and shii kuwasa juice, wherein each juice has a citric acid content of 3 to 8% by weight, is further added one time or several times in the latter half of the acetic acid fermentation.

30. The method according to claim 21 wherein the acetic acid fermentation is carried out by using an acetator.

31. The method according to claim 21 wherein after the acetic acid fermentation, the fruit vinegar is subjected to ultra filtration.